



Introduction to Behavior Modification

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- How is human behavior defined?
 - What are the defining features of behavior modification?
 - What are the historical roots of behavior modification?
 - In what ways has behavior modification improved people's lives?
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In this textbook you will learn about behavior modification, the principles and procedures used to understand and change human behavior. Behavior modification procedures come in many forms. Consider the following examples.

Ted and Jane were having some difficulties in their marriage because of frequent arguments. Their marriage counselor arranged a behavioral contract with them in which they agreed to do several nice things for each other every day. As a result of this contract, their positive interactions increased and their negative interactions (arguments) decreased.

Karen pulled her hair incessantly; as a result, she created a bald spot on the top of her head. Although she was embarrassed by the bald spot, which measured 1 inch in diameter, she continued to pull her hair. Her psychologist implemented a treatment in which Karen was to engage in a competing activity with her hands (e.g., needlepoint) each time she started to pull her hair or had the urge to pull. Over time, the hair-pulling stopped and her hair grew back in.

Francisco was gaining a lot of weight and decided to do something about it. He joined a weight loss group. At each group meeting, Francisco deposited a sum of money, set a goal for daily exercise, and earned points for meeting his exercise goals each week. If he earned a specified number of points, he got his deposit back. If he did not earn enough points, he lost part of his deposit money. Francisco began to exercise regularly and lost weight as a result of his participation in the group.

The residents of Cincinnati were making thousands of unnecessary directory assistance calls per day. These calls were clogging up the phone lines and costing the phone company money. The company instituted a charge for each directory assistance call, and the number of calls decreased dramatically.

You will notice that each of these examples focuses on some aspect of human behavior and describes ways to change the behavior. Because behavior modification focuses on behavior and behavior change, it is appropriate to begin with a discussion of behavior.

■ Defining Human Behavior

Human behavior is the subject matter of behavior modification. **Behavior** is what people do and say. The characteristics that define behavior are as follows.

- Behavior involves a person's actions (what people do or say); it is described with action verbs. Behavior is not a static characteristic of the person. If you say that a person is angry, you have not identified the person's behavior; you have simply labeled the person. If you identify what the person says or does when angry, then you have identified behavior. For example, "Jennifer screamed at her mother, ran upstairs, and slammed the door to her room." This is a description of behavior that might be labeled as anger.

- Behaviors have **dimensions** that can be measured. You can measure the **frequency** of a behavior; that is, you can count the number of times a behavior occurs (e.g., Shane bit his fingernails 12 times in the class period). You can measure the **duration** of a behavior, or the time from when an instance of the behavior starts until it stops (e.g., Rita jogged for 25 minutes). You can measure the **intensity** of a behavior or the physical force involved in the behavior (e.g., Garth bench pressed 220 pounds). You can measure the speed of behavior, or the **latency** from some event to the start of a behavior. Frequency, duration, intensity, and latency are all dimensions of a behavior. **A dimension is a measurable aspect of the behavior.**

- Behaviors can be observed, described, and recorded by others or by the person engaging in the behavior. Because a behavior is an action, its occurrence can be observed. People can see the behavior (or detect it through one of the senses) when it occurs. Because it is observable, the person who sees the behavior can

describe it and record its occurrence. (See Chapter 2 for a description of methods for recording behavior.)

- Behaviors have an impact on the environment, including the physical or the social environment (other people and ourselves). Because a behavior is an action that involves movement through space and time (Johnston & Pennypacker, 1981), the occurrence of a behavior has some effect on the environment in which it occurs. Sometimes the effect on the environment is obvious. You turn the light switch, and the light goes on (an effect on the physical environment). You raise your hand in class, and your professor calls on you (an effect on other people). You recite a phone number from a web site, and you are more likely to remember it and to dial the correct number (an effect on yourself). Sometimes the effect of a behavior on the environment is not obvious. Sometimes it has an effect only on the person who engages in the behavior. However, all human behavior operates on the physical or social environment in some way, regardless of whether we are aware of its impact.

- Behavior is lawful; that is, its occurrence is systematically influenced by environmental events. Basic behavioral principles describe the functional relationships between our behavior and environmental events. These principles describe how our behavior is influenced by, or occurs as a function of, environmental events (see Chapters 4–8). These basic behavioral principles are the building blocks of behavior modification procedures. Once you understand the environmental events that cause behaviors to occur, you can change the events in the environment to alter behavior. Consider the graph in Figure 1-1, which

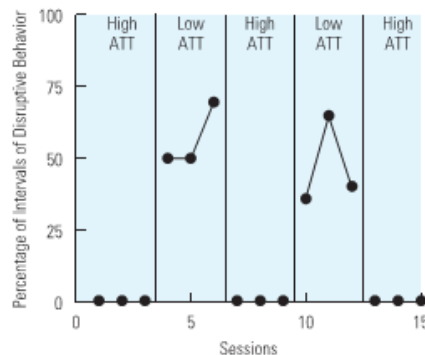


FIGURE 1-1 This graph, adapted from a study by Durand and Carr (1992), shows the influence of teacher attention on the disruptive behavior (defined as pushing away task materials; loud screaming, whining, or crying; and hitting or knocking over objects) of a young boy (Paul) in a special education classroom. The graph shows that disruptive behavior does not occur when Paul receives frequent teacher attention (High ATT). However, when Paul receives teacher attention infrequently (Low ATT), he engages in disruptive behavior about 50% of the time. This graph shows the functional relationship between the teacher's attention and Paul's disruptive behavior (From Durand, V. M., & Carr, E. G. [1992]. An analysis of maintenance following functional communication training. *Journal of Applied Behavior Analysis*, 25, 777–794. Copyright © 1992 University of Kansas Press. Reprinted by permission of the author.)

shows the disruptive behavior of a child with autism in the classroom. When the child receives high levels of attention from the teacher, his disruptive behavior rarely occurs. When the child receives low levels of attention from the teacher, his disruptive behavior occurs more frequently. We conclude that the disruptive behavior is functionally related to the level of teacher attention.

■ Behaviors may be overt or covert. Most often, behavior modification procedures are used to understand and change overt behaviors. An **overt behavior** is an action that can be observed and recorded by a person other than the one engaging in the behavior. However, some behaviors are covert. **Covert behaviors**, also called private events (Skinner, 1974), are not observable by others. For example, thinking is a covert behavior; it cannot be observed and recorded by another person. Thinking can be observed only by the person engaging in the behavior. The field of behavior modification focuses primarily on overt or observable behaviors, as does this textbook. However, Chapters 8, 24, and 25 discuss covert behaviors and behavior modification procedures applied to them.

Characteristics of Behavior

Behavior is what people do and say.

Behaviors have dimensions that can be measured.

Behaviors can be observed, described, and recorded.

Behaviors have an impact on the environment.

Behavior is lawful.

Behaviors may be overt and covert.

Examples of Behavior

Now let's illustrate the defining characteristics of behavior with some examples. The following examples include both common behaviors and problematic behaviors for which behavior modification procedures might be used.

Martha sits at her computer and types an e-mail to her parents.

This is behavior because pressing the keys on the keyboard while typing is an action, has physical dimensions (frequency of pressing keys, duration of typing), is observable and measurable, has an impact on the environment (produces letters on the screen), and is lawful (occurs because of previous learning that pressing the keys produces letters on the screen).

Mandy lies in her crib and cries loudly. Her mother then picks her up and feeds her.

This behavior has all five of the characteristics described in the previous example (an action that has measurable dimensions, is observable by others, produces an effect on the environment, and is lawful). One difference is that the effect of crying is on the social environment; her mother responds to her crying by picking her up and feeding her. Each time it has occurred in the past, crying

has resulted in her mother feeding her, so the crying continues to occur when Mandy is hungry. There is a functional relationship between the crying and the mother's behavior of feeding her.

Jerry's paper for his behavior modification class is a week late. Jerry gives the paper to his professor and lies, saying that it is late because he had to go home to see his sick grandmother. The professor then accepts the paper without any penalty. Jerry also missed his history test. He tells his history professor he missed the test because of his sick grandmother. The professor lets him take the test a week late.

Jerry's behavior—lying about his visit to his sick grandmother—has all five characteristics of a behavior. It is an action (something he said) that occurred twice (frequency), was observed by his professors, and resulted in an effect on his social environment (his professors let him take a test late and hand in a paper late with no penalty); it is lawful because there is a functional relationship between the behavior (lying) and the outcome (getting away with late papers or tests).

Samantha is a 6-year-old with an intellectual disability who attends special education classes. When the teacher is helping other students and not paying attention to Samantha, Samantha cries and bangs her head on the table or floor. Whenever Samantha bangs her head, the teacher stops what she is doing and picks Samantha up and comforts her. She tells Samantha to calm down, assures her that everything is all right, gives her a hug, and often lets Samantha sit on her lap.



Identify each of the five characteristics of Samantha's behavior.

Samantha's head banging is a behavior. It is an action that she repeats a number of times each day. The teacher could observe and record the number of occurrences each day. The head banging produces an effect on the social environment: The teacher provides attention each time the behavior occurs. Finally, the behavior is lawful; it continues to occur because there is a functional relationship between the head-banging behavior and the outcome of teacher attention.

Defining Behavior Modification

Behavior modification is the applied science and professional practice concerned with analyzing and modifying human behavior.

- *Analyzing* means identifying the functional relationship between environmental events and a particular behavior to understand the reasons for the behavior or to determine why a person behaved as he or she did.

- *Modifying* means developing and implementing procedures to help people change their behavior. It involves altering environmental events so as to influence behavior. Behavior modification procedures are developed by professionals (e.g., board certified behavior analysts) and used to change socially significant behaviors, with the goal of improving some aspect of a person's life. Following are some characteristics that define behavior modification (Cambrill, 1977; Kazdin, 1994).

■ Characteristics of Behavior Modification

■ *Focus on behavior.* Behavior modification procedures are designed to change behavior, not a personal characteristic or trait. Therefore, behavior modification de-emphasizes labeling. For example, behavior modification is not used to change autism (a label); rather, behavior modification is used to change problem behaviors exhibited by children with autism.

Behavioral excesses and deficits are targets for change with behavior modification procedures. In behavior modification, the behavior to be modified is called the **target behavior**. A **behavioral excess** is an undesirable target behavior the person wants to decrease in frequency, duration, or intensity. Smoking is an example of a behavioral excess. A **behavioral deficit** is a desirable target behavior the person wants to increase in frequency, duration, or intensity. Exercise and studying are possible examples of behavioral deficits.

■ *Guided by the theory and philosophy of behaviorism.* The guiding theoretical framework behind behavior modification is **behaviorism**. Initially developed by B. F. Skinner (1953a, 1974), behaviorism's core tenets are that behavior is lawful and controlled by environmental events occurring in close temporal relation to the behavior (see also Baum, 1994; Chiesa, 1994).

■ *Procedures based on behavioral principles.* Behavior modification is the application of basic principles originally derived from experimental research with laboratory animals (Skinner, 1938). The scientific study of behavior is called the **experimental analysis of behavior**, or behavior analysis (Skinner, 1953b, 1966). The scientific study of human behavior to help people change behavior in meaningful ways is called **applied behavior analysis** (Baer, Wolf, & Risley, 1968, 1987). Behavior modification procedures are based on research in applied behavior analysis that has been conducted for more than 50 years (Ullmann & Krasner, 1965; Ulrich, Stachnik, & Mabry, 1966).

■ *Emphasis on current environmental events.* Behavior modification involves assessing and modifying the current environmental events that are functionally related to the behavior. Human behavior is controlled by events in the immediate environment, and the goal of behavior modification is to identify those events. Once these **controlling variables** have been identified, they are altered to modify the behavior. Successful behavior modification procedures alter the functional relationships between the behavior and the controlling variables in the environment to produce a desired change in the behavior. Sometimes labels are mistakenly identified as the causes of behavior. For example, a person might say that a child with autism engages in problem behaviors (such as screaming, hitting himself, refusal to follow instructions) because the child is autistic. In other words, the person is suggesting that autism causes the child to engage in the behavior. However, autism is simply a label that describes the pattern of behaviors the child engages in. The label cannot be the cause of the behavior because the label does not exist as a physical entity or event. The causes of the behavior must be found in the environment (including the biology of the child).

Behavior Modification and Applied Behavior Analysis

Behavior modification (as described in this textbook) and applied behavior analysis are two terms used to identify virtually identical fields. Although research on the application of behavioral principles to help people change their behavior (behavior modification) had been published since the late 1950s, the term *applied behavior analysis* was introduced in 1968 in the first issue of the *Journal of Applied Behavior Analysis* with the publication of Baer, Wolf, and Risley's article defining applied behavior analysis. In their article, Baer et al. (1968) identified a number of characteristics of applied behavior analysis including: (a) a focus on socially important behavior; (b) demonstration of functional relationships between environmental events and behavior; (c) clear description of procedures; (d) connection to basic behavioral principles; and (e) production of meaningful, generalizable, and long-lasting changes in behavior. These defining features of applied behavior analysis also characterize the contemporary field of behavior modification as described in this textbook.

■ *Precise description of behavior modification procedures* (Baer et al., 1968). Behavior modification procedures involve specific changes in environmental events that are functionally related to the behavior. For the procedures to be effective each time they are used, the specific changes in environmental events must occur each time. By describing procedures precisely, researchers and other professionals make it more likely that the procedures will be used correctly each time.

■ *Treatment implemented by people in everyday life* (Kazdin, 1994). Behavior modification procedures are developed by professionals (Board Certified Behavior Analysts, Board Certified Assistant Behavior Analysts, or other professionals such as Licensed Psychologists specifically trained in behavior modification). However, behavior modification procedures often are implemented by people such as teachers, parents, job supervisors, or others to help people change their behavior. People who implement behavior modification procedures should do so only after sufficient training. Precise descriptions of procedures and professional supervision make it more likely that parents, teachers, and others will implement procedures correctly.

■ *Measurement of behavior change*. One of the hallmarks of behavior modification is its emphasis on measuring the behavior before and after intervention to document the behavior change resulting from the behavior modification procedures. In addition, ongoing assessment of the behavior is done well beyond the point of intervention to determine whether the behavior change is maintained in the long run. If a supervisor is using behavior modification procedures to increase work productivity (to increase the number of units assembled each day), he or she would record the workers' behavior for a period before implementing the procedures. The supervisor would then implement the behavior modification procedures and continue to record the behavior. This recording would establish whether the number of units assembled increased. If the workers' behavior changed after the supervisor's intervention, he or she would continue to record the behavior for a further period. Such long-term observation would demonstrate whether the workers continued to assemble units at the increased rate or whether further intervention was necessary.

■ *De-emphasis on past events as causes of behavior*. As stated earlier, behavior modification places emphasis on recent environmental events as the causes of behavior. However, knowledge of the past also provides useful information about

environmental events related to the current behavior. For example, previous learning experiences have been shown to influence current behavior. Therefore, understanding these learning experiences can be valuable in analyzing current behavior and choosing behavior modification procedures. Although information on past events is useful, knowledge of current controlling variables is most relevant to developing effective behavior modification interventions because those variables, unlike past events, can still be changed.

■ *Rejection of hypothetical underlying causes of behavior.* Although some fields of psychology, such as Freudian psychoanalytic approaches, might be interested in hypothesized underlying causes of behavior, such as an unresolved Oedipus complex, behavior modification rejects such hypothetical explanations of behavior. Skinner (1974) has called such explanations “explanatory fictions” because they can never be proved or disproved, and thus are unscientific. These supposed underlying causes can never be measured or manipulated to demonstrate a functional relationship to the behavior they are intended to explain.

Characteristics of Behavior Modification

Focus on behavior
 Guided by the theory and philosophy of behaviorism
 Based on behavioral principles
 Emphasis on current environmental events
 Precise description of procedures
 Implemented by people in everyday life
 Measurement of behavior change
 De-emphasis on past events as causes of behavior
 Rejection of hypothetical underlying causes of behavior

Historical Roots of Behavior Modification

A number of historical events contributed to the development of behavior modification. Let’s briefly consider some important figures, publications, and organizations in the field.

Major Figures

Following are some of the major figures who were instrumental in developing the scientific principles on which behavior modification is based (Figure 1-2) (Michael, 1993a).

Ivan P. Pavlov (1849–1936) Pavlov conducted experiments that uncovered the basic processes of respondent conditioning (see Chapter 8). He demonstrated that a reflex (salivation in response to food) could be conditioned to a neutral stimulus. In his experiments, Pavlov presented the neutral stimulus (the sound of a metronome) at the same time that he presented food to a dog. Later, the dog

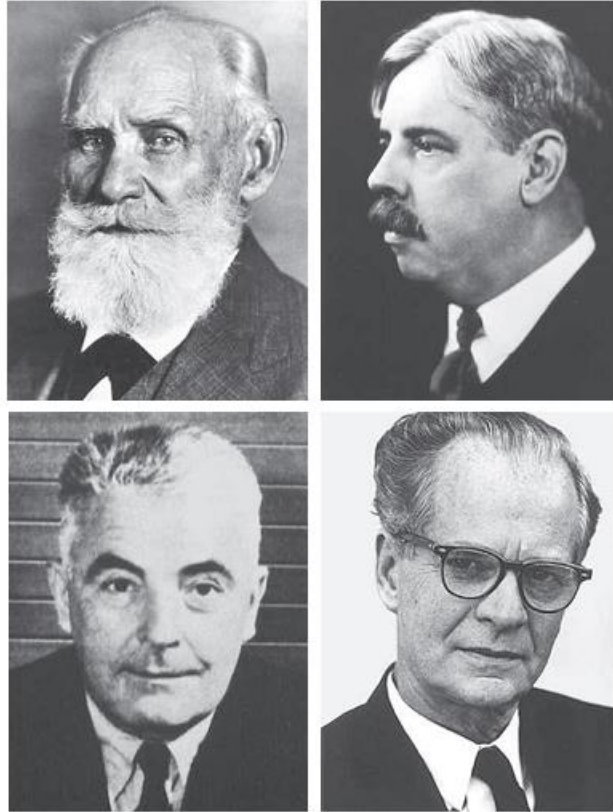


FIGURE 1-2 Four major figures who were instrumental in developing the scientific principles on which behavior modification is based. Clockwise from top left: Ivan P. Pavlov, Edward L. Thorndike, B. F. Skinner, John B. Watson. (Photo credits: SOV; Archives of the History of American Psychology, Center for the History of Psychology-The University of Akron; Courtesy of the B. F. Skinner Foundation; Archives of the History of American Psychology, Center for the History of Psychology-The University of Akron.)

salivated in response to the sound of the metronome alone. Pavlov called this a conditioned reflex (Pavlov, 1927).

Edward L. Thorndike (1874–1949) Thorndike's major contribution was the description of the law of effect. The law of effect states that a behavior that produces a favorable effect on the environment is more likely to be repeated in the future. In Thorndike's famous experiment, he put a cat in a cage and set food outside the cage where the cat could see it. To open the cage door, the cat had to hit a lever with its paw. Thorndike showed that the cat learned to hit the lever and open the cage door. Each time it was put into the cage, the cat hit the lever more

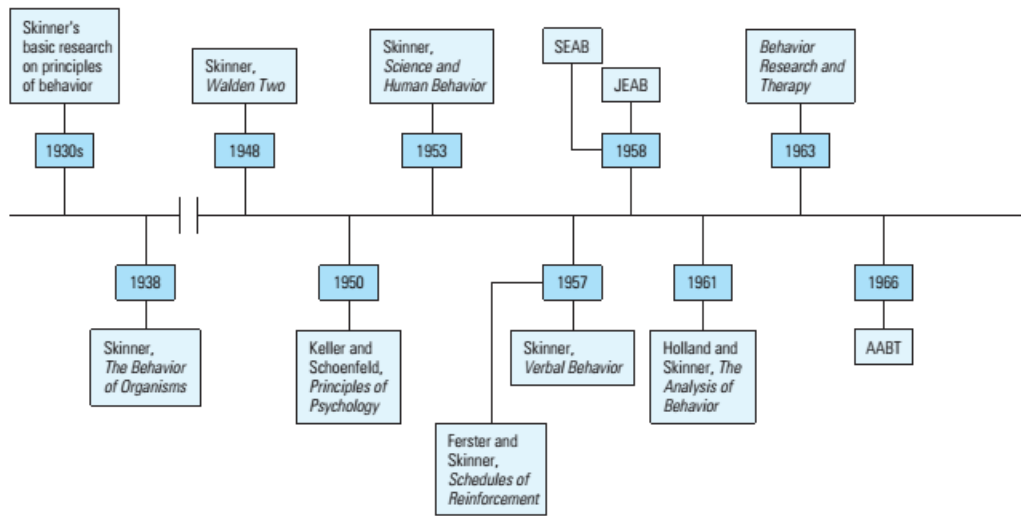
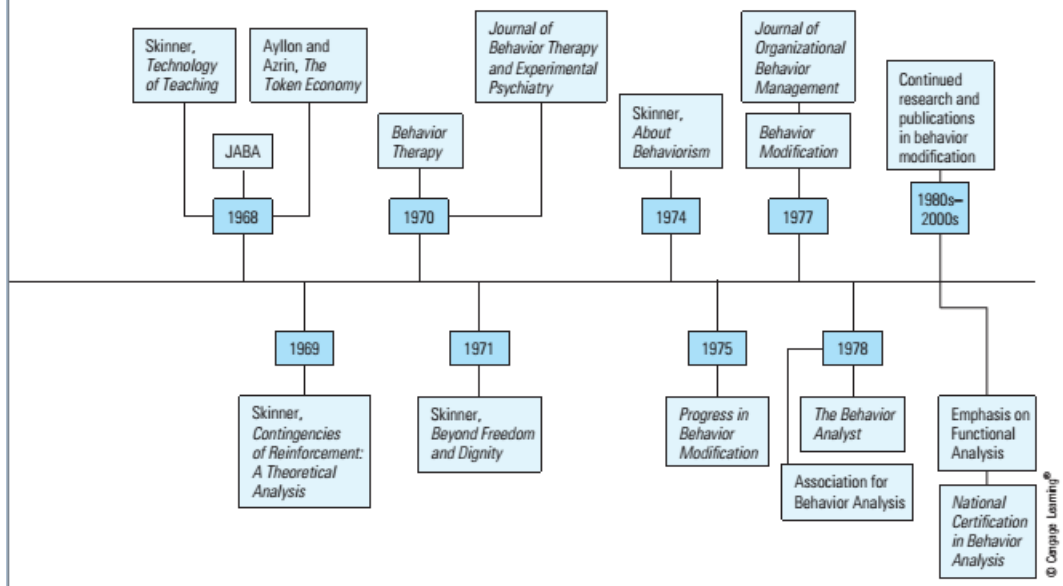


FIGURE 1-3 This timeline shows the major events in the development of behavior modification. Starting in the 1930s with Skinner's basic research on the principles of behavior, the timeline includes major books, journals, and professional organizations. SEAB, Society for the Experimental Analysis of Behavior; JEAB, *Journal of the Experimental Analysis of Behavior*; AABT, Association for Advancement of Behavior Therapy; JABA, *Journal of Applied Behavior Analysis*.

quickly because that behavior—hitting the lever—produced a favorable effect on the environment: It allowed the cat to reach the food (Thorndike, 1911).

John B. Watson (1878–1958) In the article “Psychology as the Behaviorist Views It,” published in 1913, Watson asserted that observable behavior was the proper subject matter of psychology, and that all behavior was controlled by environmental events. In particular, Watson described a stimulus–response psychology in which environmental events (stimuli) elicited responses. Watson started the movement in psychology called behaviorism (Watson, 1913, 1924).

B. F. Skinner (1904–1990) Skinner expanded the field of behaviorism originally described by Watson. Skinner explained the distinction between respondent conditioning (the conditioned reflexes described by Pavlov and Watson) and operant conditioning, in which the consequence of behavior controls the future occurrence of the behavior (as in Thorndike's law of effect). Skinner's research elaborated the basic principles of operant behavior (see Chapters 4–7). In addition to his laboratory research demonstrating basic behavioral principles, Skinner wrote a number of books in which he applied the principles of behavior analysis to human behavior. Skinner's work is the foundation of behavior modification (Skinner, 1938, 1953a).



Early Behavior Modification Researchers

After Skinner laid out the principles of operant conditioning, researchers continued to study operant behavior in the laboratory (Catania, 1968; Honig, 1966). In addition, in the 1950s, researchers began demonstrating behavioral principles and evaluating behavior modification procedures with people. These early researchers studied the behavior of children (Azrin & Lindsley, 1956; Baer, 1960; Bijou, 1957), adults (Goldiamond, 1965; Verplanck, 1955; Wolpe, 1958), patients with mental illness (Ayllon & Azrin, 1964; Ayllon & Michael, 1959), and individuals with intellectual disabilities (Ferster, 1961; Fuller, 1949; Wolf, Risley, & Mees, 1964). Since the beginning of behavior modification research with humans in the 1950s, thousands of studies have established the effectiveness of behavior modification principles and procedures.

Major Publications and Events

A number of books heavily influenced the development of the behavior modification field. In addition, scientific journals were developed to publish research in behavior analysis and behavior modification, and professional organizations were started to support research and professional activity in behavior analysis and behavior modification. These books, journals, and organizations are listed in the timeline in Figure 1-3. (For a more complete description of these publications and organizations, see Cooper, Heron, and Heward [1987; 2007] and Michael [1993a].)

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■ Areas of Application

Behavior modification procedures have been used in many areas to help people change a vast array of problematic behaviors (Carr & Austin, 2001; Gambrill, 1977; Lutzker & Martin, 1981; Vollmer, Borrero, Wright, Van Camp, & Lalli, 2001). This section briefly reviews these areas of application.

Developmental Disabilities

More behavior modification research has been conducted in the field of developmental disabilities than perhaps any other area (Iwata et al., 1997). People with developmental disabilities often have serious behavioral deficits, and behavior modification has been used to teach a variety of functional skills to overcome these deficits (Repp, 1983). In addition, people with developmental disabilities may exhibit serious problem behaviors such as self-injurious behaviors, aggressive behaviors, and destructive behaviors. A wealth of research in behavior modification demonstrates that these behaviors often can be controlled or eliminated with behavioral interventions (Barrett, 1986; Beavers, Iwata, & Leman, 2013; Repp & Horner, 1999; Van Houten & Axelrod, 1993; Whitman, Scibak, & Reid, 1983; Williams, 2004). Behavior modification procedures also are used widely in staff training and staff management in the field of developmental disabilities (Reid, Parsons, & Green, 1989, 2012).

Mental Illness

Some of the earliest research in behavior modification demonstrated its effectiveness in helping people with mental illness in institutional settings (Ayllon, 1963; Ayllon & Michael, 1959). Behavior modification has been used with patients with chronic mental illness to modify such behaviors as daily living skills, social behavior, aggressive behavior, treatment compliance, psychotic behaviors, and work skills (Dixon & Holcomb, 2000; Scotti, McMorrow, & Trawitzki, 1993; Wilder, Masuda, O'Connor, & Baham, 2001). One particularly important contribution of behavior modification was the development of a motivational procedure for institutional patients called a token economy (Ayllon & Azrin, 1968). Token economies are still widely used in a variety of treatment settings (Kazdin, 1982).

Education and Special Education

Behavior modification procedures are used widely in education (Alberto & Troutman, 2003) and great strides have been made in the field of education because of behavior modification research (Bijou & Ruiz, 1981). Researchers have analyzed student-teacher interactions in the classroom, improved teaching methods, and developed procedures for reducing problem behaviors in the classroom (Bambara & Kern, 2005; Becker & Carmine, 1981; Madsen, Becker, & Thomas, 1968; Sugai & Horner, 2005; Thomas, Becker, & Armstrong, 1968).

Behavior modification procedures have also been used in higher education to improve instructional techniques, and thus improve student learning (Michael, 1991; Saville & Zinn, 2009).

In special education, that is, the education of people with developmental disabilities or other special needs, behavior modification has played a major role (Rusch et al., 1988) in developing teaching methods, controlling problem behaviors in the classroom, improving social behaviors and functional skills, promoting self-management, and training teachers.

Rehabilitation

Rehabilitation is the process of helping people regain normal function after an injury or trauma, such as a head injury from an accident or brain damage from a stroke. Behavior modification is used in rehabilitation to promote compliance with rehabilitation routines such as physical therapy, to teach new skills that can replace skills lost through the injury or trauma, to decrease problem behaviors, to help manage chronic pain, and to improve memory performance (Bakke et al., 1994; Davis & Chittum, 1994; Heinicke, Carr, & Mozzoni, 2009; O'Neill & Gardner, 1983; Tasky, Rudrud, Schulze, & Rapp, 2008).

Community Psychology

Within community psychology, behavioral interventions are designed to influence the behavior of large numbers of people in ways that benefit everybody. Some targets of behavioral community interventions include reducing littering, increasing recycling, reducing energy consumption, reducing unsafe driving, reducing illegal drug use, increasing the use of seat belts, decreasing illegal parking in spaces for the disabled, and reducing speeding (Cope & Allred, 1991; Cox & Geller, 2010; Geller & Hahn, 1984; Ludwig & Geller, 1991; Van Houten & Nau, 1981; Van Houten, Van Houten, & Malenfant, 2007).

Clinical Psychology

In clinical psychology, psychological principles and procedures are applied to help people with personal problems. Typically, clinical psychology involves individual or group therapy conducted by a psychologist. Behavior modification in clinical psychology, often called behavior therapy, has been applied to the treatment of a wide range of human problems (Hersen & Bellack, 1985; Hersen & Rosqvist, 2005; Hersen & Van Hasselt, 1987; Spiegler & Guevremont, 2010; Turner, Calhoun, & Adams, 1981). Behavior modification procedures have also been used to train clinical psychologists (Veltum & Miltenberger, 1989).

Business, Industry, and Human Services

The use of behavior modification in the field of business, industry, and human services is called organizational behavior modification or organizational behavior management (Bailey & Burch, 2010; Daniels, 2000; Frederickson, 1982; Luthans & Kreitner, 1985; Reid et al., 1989, 2012; Stajkovic & Luthans, 1997). Behavior modification procedures have been used to improve work performance and job safety and to decrease tardiness, absenteeism, and accidents on the job. In addition, behavior modification procedures have been used to improve supervisors' performances. The use of behavior modification in business and industry has

resulted in increased productivity and profits for organizations and increased job satisfaction for workers.

Self-Management

People use behavior modification procedures to manage their own behaviors. They use self-management procedures to control personal habits, health-related behaviors, professional behaviors, and personal problems (Brigham, 1989; Epstein, 1996; Stuart, 1977; Watson & Tharp, 1993; 2007; Yates, 1986). Chapter 20 discusses the application of behavior modification procedures for self-management.

Child Behavior Management

Numerous applications of behavior modification to the management of child behavior exist (Durand & Hieneman, 2008; Hieneman, Childs, & Sergay, 2006; Miller, 1975; Patterson, 1975; Miltenberger & Crosland, 2014; Schaeffer & Millman, 1981). Parents and teachers can learn to use behavior modification procedures to help children overcome bed-wetting, nail-biting, temper tantrums, noncompliance, aggressive behaviors, bad manners, stuttering, and other common problems (Christophersen & Mortweet, 2001; Gross & Drabman, 2005; Watson & Gresham, 1998).

Prevention

Behavior modification procedures have been applied to preventing problems in childhood (Roberts & Peterson, 1984). Other applications of behavior modification in the area of prevention include preventing child sexual abuse, child abduction, accidents in the home, child abuse and neglect, poisoning, infections, and sexually transmitted diseases (Beck & Miltenberger, 2009; Carroll, Miltenberger, & O'Neill, 1992; Dancho, Thompson, & Rhoades, 2008; Miltenberger et al., 2013; Montesinos, Frisch, Greene, & Hamilton, 1990; Poche, Yoder, & Miltenberger, 1988). Preventing problems in the community with behavior modification is one aspect of community psychology.

Sports Performance

Behavior modification is used widely to enhance sports performance (Martin & Hrycaiko, 1983). Behavior modification procedures have been used to improve athletic performance in a wide variety of sports during practice and in competition (Boyer, Miltenberger, Batsche, & Fogel, 2009; Brobst & Ward, 2002; Hume & Crossman, 1992; Kendall, Hrycaiko, Martin, & Kendall, 1990; Luiselli, Woods, & Reed, 2011; Wack, Crosland, & Miltenberger, 2014; Wolko, Hrycaiko, & Martin, 1993; Zeigler, 1994). Behavior modification procedures have been shown to result in better athletic performance than do traditional coaching procedures.

Health-Related Behaviors

Behavior modification procedures are used to promote health-related behaviors by increasing healthy lifestyle behaviors (such as exercise and proper nutrition) and decreasing unhealthy behaviors (such as smoking, drinking, and overeating). Behavior modification procedures are also used to promote behaviors that have a positive

influence on physical or medical problems—such as decreasing frequency and intensity of headaches, lowering blood pressure, and reducing gastrointestinal disturbances (Blumenthal & McKee, 1987; Dallery, Raiff, & Grabinski, 2013; Dallery, Meredith, & Glenn, 2008; Gentry, 1984; Reynolds, Dallery, Shroff, Patak, & Leraas, 2008; Van Camp & Hayes, 2012; Van Worner, 2004)—and to increase compliance with medical regimens (Levy, 1987). Applying behavior modification to health-related behaviors is also called behavioral medicine or health psychology.

Gerontology

Behavior modification procedures are applied in nursing homes and other care facilities to help manage the behavior of older adults (Hussian, 1981; Hussian & Davis, 1985). Behavior modification procedures are used to help older adults deal with their declining physical abilities, to help them adjust to nursing home environments, to promote health-related behaviors and appropriate social interactions, and to decrease problem behaviors that may arise from Alzheimer’s disease, other types of dementia, or institutional demands (Carstensen & Erickson, 1986; Dwyer-Moore & Dixon, 2007; Moore, Delaney, & Dixon, 2007; Stock & Milan, 1993).

Professional Practice, Certification, and Ethics

As more research was published over the years establishing the effectiveness of behavior modification procedures for changing a wide range of socially significant behaviors, the practice of behavior modification became more widespread and became synonymous with the emerging discipline of applied behavior analysis (Baer et al., 1968). With more and more individuals working as applied behavior analysts, the field began to focus on professional practice, certification, and ethics to regulate the use of behavior modification procedures (Bailey & Burch, 2011; Shook, 1993; Starin, Hemingway, & Hartsfield, 1993). The Behavior Analyst Certification Board™ (BACB) was established to provide certification for individuals to practice behavior analysis as a profession. The BACB established education and training standards and developed an examination that individuals had to pass to become a Board Certified Behavior Analyst or a Board Certified Assistant Behavior Analyst (see BACB.com for complete details). In addition, the Association for Behavior Analysis International™ developed a set of ethical guidelines for the practice of behavior analysis (Bailey & Burch, 2011). Today, individuals using behavior modification procedures to help people change their behavior must be certified by the BACB to assure that they are engaging in the competent and ethical practice of applied behavior analysis.

The Structure of This Textbook

This textbook is divided into five major sections. These sections discuss the following topics:

- Measurement of behavior and behavior change
- Basic principles of behavior

- Procedures to establish new behaviors
- Procedures to decrease undesirable behaviors and increase desirable behaviors
- Other behavior change procedures

The book is designed so that the information presented in earlier sections is applied in later sections.

Measurement of Behavior and Behavior Change

There are two chapters in Part 1 of this textbook. Chapter 2 teaches you how to observe and record behaviors that are to be modified in a behavior modification program. Chapter 3 teaches you how to construct graphs and evaluate graphed data to analyze behavior change resulting from a behavior modification program.

Basic Principles of Behavior

The five chapters in Part 2 of this textbook discuss the basic principles of behavior modification derived from scientific research in behavior analysis. The behavior modification procedures discussed in the remainder of the book are based on the basic behavioral principles reviewed in this section, which include reinforcement, extinction, punishment, stimulus control, and respondent conditioning. Once you understand these basic principles, it will be easier to understand and apply the behavior modification procedures described in later sections.

Procedures to Establish New Behaviors

One goal of behavior modification is to establish desirable new behaviors or skills. The four chapters in Part 3 of this textbook discuss behavior modification procedures used to establish new behaviors: shaping, prompting and transfer of stimulus control, chaining, and behavioral skills training procedures.

Procedures to Increase Desirable Behaviors and Decrease Undesirable Behaviors

Another goal of behavior modification procedures is to decrease the occurrence of undesirable behaviors and increase the occurrence of desirable behaviors that are not occurring frequently enough. The occurrence of undesirable behaviors is a behavioral excess. Desirable behaviors that occur too infrequently are behavioral deficits. The seven chapters in Part 4 describe how to analyze events that influence behavior and how to apply reinforcement, extinction, stimulus control, and punishment to decrease excess behaviors while increasing more desirable behaviors.

Other Behavior Change Procedures

The six chapters in Part 5 of this textbook describe more complex behavior modification procedures. Chapter 20 discusses self-management procedures. Chapter 21 discusses habit disorders and procedures for decreasing these excess

behaviors. Chapter 22 on token economies and Chapter 23 on behavioral contracting discuss procedures that extend the reinforcement and punishment procedures described earlier. Chapter 24 applies procedures based on respondent conditioning to decrease fear and anxiety. Chapter 25 discusses behavior modification procedures to change cognitive behaviors, a type of covert behavior.

CHAPTER SUMMARY

1. Human behavior is defined as an individual's actions that have one or more dimensions that can be observed and recorded. Behaviors have an impact on the physical or social environment. Behavior is lawful; its occurrence is influenced by environmental events. A behavior may be overt or covert.
2. Behavior modification procedures involve analyzing and manipulating current environmental events to change behavior. A behavioral excess or behavioral deficit may be targeted for change with behavior modification procedures. Behavior modification procedures are based on behavioral principles derived from scientific research. B. F. Skinner conducted the early scientific research that laid the foundation for behavior modification. He also published a number of books demonstrating the application of behavioral principles to everyday life. Behavior modification procedures often are implemented by people in everyday life. Behavior is measured before and after the behavior modification procedures are applied to document the effectiveness of the procedures. Behavior modification de-emphasizes past events and rejects hypothetical underlying causes of behavior.
3. The historical roots of behavior modification can be found in the work of Pavlov, Thorndike, Watson, and especially B. F. Skinner, who identified a number of basic principles of behavior and wrote about applying the principles of behavior analysis to human behavior.
4. Behavior modification procedures have been applied successfully to all aspects of human behavior, including developmental disabilities; mental illness; education and special education; rehabilitation; community psychology; clinical psychology; business, industry, and human services; self-management; child behavior management; prevention; sports performance; health-related behaviors; and gerontology.

KEY TERMS

applied behavior analysis, 6	controlling variable, 6	frequency, 2
behavior, 2	covert behaviors, 4	intensity, 2
behaviorism, 6	dimensions, 2	latency, 2
behavioral excess, 6	duration, 2	law of effect, 9
behavior modification, 5	experimental analysis of	overt behavior, 4
behavioral deficit, 6	behavior, 6	target behavior, 6

PRACTICE TEST

1. What is behavior? (p. 2)
2. Provide an example of a description of behavior and the label applied to that behavior. (p. 2)
3. Identify and describe the four dimensions of behavior that can be observed and recorded. (p. 2)

4. Provide an example of how a behavior has an impact on the physical environment. Provide an example of how a behavior has an impact on the social environment. (p. 3)
5. What does it mean to say that behavior is lawful? What is a functional relationship? (p. 3)
6. Describe the distinction between overt behavior and covert behavior. Provide an example of each. Which type of behavior is the focus of this book? (p. 4)
7. Identify the six characteristics of human behavior. (p. 4)
8. What does it mean to say that behavior modification procedures are based on behavioral principles? (p. 6)
9. What causes human behavior? Describe how a label might be mistakenly identified as a cause of a behavior. (p. 6)
10. Why is it important to describe behavior modification procedures precisely? (p. 7)
11. Who implements behavior modification procedures? (p. 7)
12. Why is it important to measure behavior before and after behavior modification procedures are used? (p. 7)
13. Why doesn't behavior modification focus on the past as the cause of the behavior? (pp. 7–8)
14. Identify nine defining characteristics of behavior modification. (pp. 4–8)
15. Briefly describe the contributions of Pavlov, Thorndike, Watson, and Skinner to the development of behavior modification. (pp. 8–10)
16. Identify at least one way in which behavior modification has been applied in each of the following areas: developmental disabilities; education; community psychology; business, industry, and human services; self-management; prevention; health-related behaviors; mental illness; rehabilitation; clinical psychology; child management; sports performance; and gerontology. (pp. 12–15)